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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,780	12/27/2001	Ioannis Pavlidis	H0002442-2	1212
128	7590	08/25/2005	EXAMINER	
HONEYWELL INTERNATIONAL INC. 101 COLUMBIA ROAD P O BOX 2245 MORRISTOWN, NJ 07962-2245			LAVIN, CHRISTOPHER L	
			ART UNIT	PAPER NUMBER
			2621	

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/034,780	Applicant(s) PAVLIDIS ET AL.	
	Examiner Christopher L. Lavin	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/03/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1 – 7 and 14 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stauffer et al. ("Adaptive background mixture models for real-time

tracking", Proceedings 1999 IEEE Conference on Computer Vision and Pattern Recognition, Fort Collins, Col., 1999 June 23 – 25; 2:246 – 252) in view of Menon (5,537,488).

In regards to claim 1, Stauffer discloses a method for use in monitoring a search area, the method comprising (in the second paragraph of the abstract on page 246 a "stable, real-time outdoor tracker which reliably deals with lighting changes, repetitive motions from clutter, and long-term scene changes." Stauffer is disclosing a method for monitoring a search area, which must be preformed for tracking.):

providing frames of image data representative of a search area, the image data comprising pixel value data for a plurality of pixels (In the second paragraph of the introduction on page 246 Stauffer discloses using the tracking method for video surveillance. Inherent in video surveillance is the step of providing frames of image data representative of the search area. As a computer must perform this method the image data must comprise of pixel value data.);

providing a plurality of time varying distributions for each pixel based on the pixel value data (Stauffer discloses providing a plurality of time varying distributions on page 248 in the second column, second full paragraph. "The recent history of each pixel [...] is modeled by a mixture of K Gaussian distributions.");

providing at least one frame of update image data representative of the search area in an update cycle, the frame of image data comprising update pixel value data for each of the plurality of pixels (As previously noted Stauffer's tracking method is designed to deal with "long-term scene changes" and thus every image frame can be

considered an update image, the frame would comprise of update pixel value data for each of the plurality of pixels. Stauffer notes in the first partial paragraph on page 249, "so we use an approximate method which essentially treats each new observation as a sample set of size 1 and uses standard learning rules to integrate the new data."); and

attempting to match the update pixel value data for each pixel [to each of all] of the plurality of time varying distributions provided for the pixel (In the first full paragraph on page 249 Stauffer discloses the step of attempting to match the update pixel data to the time varying distributions. "Every new pixel value, X_t , is checked against the existing K Gaussian distributions, until a match is found.");

updating the plurality of time varying distributions for each pixel based on whether the update pixel value data matches one of the plurality of time varying distributions provided for the pixel (Stauffer notes in the second full paragraph on page 249 that "if none of the K distributions match the current pixel value, the least probable distribution is replaced". This is the step of updating the plurality of time varying distributions based on whether there is a match or not.); and

ordering the updated plurality of time varying distributions for each pixel based on a probability of the time varying distributions thereof being representative of background or foreground information in the search area for use in determining whether the pixel is to be considered background or foreground information (The second full paragraph on page 249 shows that the time varying distributions are ordered. Finally in the second paragraph of Background Model Estimation on the same page Stauffer discloses that the time varying distributions represent either background or foreground (new object).

Stauffer further shows that background and foreground are differentiated in the first paragraph under Connected Components on page 250, "the method described above allows us to identify foreground pixels in each new frame".).

As the applicant has pointed out in remarks filed on 06/03/05 Stauffer does not attempt to match the update pixel value data to every time varying distributions, but instead stops at the first distribution that meets the requirements for a match.

Menon teaches (col. 5, line 50 – col. 6, line 8) in the area of pattern recognition that a pattern should be compared to every category. And then the best match should be selected. This is the same concept as what is being described in the claimed invention.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to compare the update pixel value data to every distribution before declaring a match (as taught by Menon) in the method disclosed by Stauffer. Depending on the variance allowed in a match by Stauffer the first "match" found could be far from ideal. By checking through all of the distributions the best match can be found which will lead to more accurate results.

In regards to claim 14, Stauffer discloses a system for use in monitoring a search area, the system comprising (Stauffer discloses in the second paragraph of the abstract on page 246 a "stable, real-time outdoor tracker which reliably deals with lighting changes, repetitive motions from clutter, and long-term scene changes." Stauffer is disclosing a system for monitoring a search area, which must be preformed for tracking.):

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one or more imaging devices operable to provide frames of image data representative of the search area, the image data comprising pixel value data for a plurality of pixels, wherein the frames of image data comprises at least one frame of update image data representative of the search area in an update cycle, the frame of update image data comprising update pixel value data for each of the plurality of pixels (In the second paragraph of the introduction on page 246 Stauffer discloses using the tracking method for video surveillance. Video surveillance of course requires an imaging device. Inherent in video surveillance is the step of providing frames of image data representative of the search area. As a computer must perform this method the image data must comprise of pixel value data. Stauffer discloses providing a plurality of time varying distributions on page 248 in the second column, second full paragraph. "The recent history of each pixel [...] is modeled by a mixture of K Gaussian distributions."); and

a computer apparatus operable to (A computer of some sort is necessary to carry out the operations disclosed by Stauffer):

attempt to match the update pixel value data for each pixel [to each of all] of the plurality of time varying distributions provided for the pixel (In the first full paragraph on page 249 Stauffer discloses the step of attempting to match the update pixel data to the time varying distributions. "Every new pixel value, X_t , is checked against the existing K Gaussian distributions, until a match is found." Stauffer notes in the next paragraph that "if none of the K distributions match the current pixel value, the least probable

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distribution is replaced". This is the step of updating the plurality of time varying distributions based on whether there is a match or not.);

update the plurality of time varying distributions for each pixel based on whether the update pixel value data matches one of the plurality of time varying distributions provided for the pixel (As previously noted Stauffer's tracking method is designed to deal with "long-term scene changes" and thus every image frame can be considered an update image, the frame would comprise of update pixel value data for each of the plurality of pixels. Stauffer notes in the first partial paragraph on page 249, "so we use an approximate method which essentially treats each new observation as a sample set of size 1 and uses standard learning rules to integrate the new data."); and

order the updated plurality of time varying distributions for each pixel based on a probability of the time varying distributions thereof being representative of background or foreground information in the search area for use in determining whether the pixel is to be considered background or foreground information (The second full paragraph of page 249 shows that the time varying distributions are ordered. Finally in the second paragraph of Background Model Estimation on the same page Stauffer discloses that the time varying distributions represent either background or foreground (new object). Stauffer further shows that background and foreground are differentiated in the first paragraph under Connected Components on page 250, "the method described above allows us to identify foreground pixels in each new frame".).

As the applicant has pointed out in remarks filed on 06/03/05 Stauffer does not attempt to match the update pixel value data to every time varying distributions, but instead stops at the first distribution that meets the requirements for a match.

Menon teaches (col. 5, line 50 – col. 6, line 8) in the area of pattern recognition that a pattern should be compared to every category. And then the best match should be selected. This is the same concept as what is being described in the claimed invention.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to compare the update pixel value data to every distribution before declaring a match (as taught by Menon) in the system disclosed by Stauffer. Depending on the variance allowed in a match by Stauffer the first “match” found could be far from ideal. By checking through all of the distributions the best match can be found which will lead to more accurate results.

The remainder of the claims are rejected for the same reasons as presented in the previous office action with of course the added 103 shown in the independent claims 1 and 14.

Response to Arguments

5. Applicant's arguments, see Remarks, filed 06/03/05, with respect to the rejection(s) of claim(s) 1 and 14 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Menon.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L. Lavin whose telephone number is 571-272-7392. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mancuso Joseph can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Lavin



BRIAN WERNER
PRIMARY EXAMINER